

Appendix B

SUPPLEMENTARY INFORMATION

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WATER PROVIDERS IN PIMA COUNTY

Following is a list of water providers in Pima County registered with the Environmental Protection Agency in 1998. Note that some are schools or businesses providing water only during certain hours. If some of the following population numbers do not agree with those in the text, its because they may represent different years.

<u>Water System</u>	<u>Population Served</u>				
A-A RV Campground	100	Coronado Forest Drive In	40	Greenfields School	250
ADOC-Correction Training	3700	Cortaro Acres Home	30	Gringo Pass Trailer Park	55
ADOT Canoa R/A	1375	Cortaro Water Users Assn	1,920	Halcyon Acres	400
Ajo Domestic Water Improvement	2190	Cyprus Sierrita Corp	760	Halfway Station MHP	64
Amity Circle Tree Ranch	150	Decker Community Water Co	29	High Chaparral Water Coop	35
Amphitheater School District	10,615	Deep Well Cooperative	40	Hohokam Mobile Home Park	60
Arivaca Townsite Water Co	240	Del Lago Water Co	990	Homeowners Coop	45
ASARCO Silver Bell Unit	930	Desert Hills School	107	Hub Water Co	4,040
Avra Water Coop, Inc	3,300	Desert Shores MHP	405	Hughes Missile Systems Co	4,000
AZ Parks Board-Catalina St	400	Desert Water Well Coop S	45	IBM	3,100
AZ Portland Cement-plant	160	Desert Willows MHP	320	I M Water Co Inc	340
AZ Water Co-Ajo	2,000	Diamond Grove Mobile HE	208	King's Trailer Lodge	45
Bermuda Gardens Trailer	93	Dome Well Association	27	Kino Mobile Home Park	110
Breakers Water Park	533	DYTR-Catalina Mountain	450	Kitt Peak National Observatory	300
C & N Water Co	32	E & T Water Co	800	La Casita Water Co	25
Cactus Country Tr Haven	250	Elkhorn Ranch	50	La Cholla Air Park Ed Pr	200
Mt. Lemmon Camps	850	Emery Park Mobile Home Pk	240	Lago Del Oro Water Co	4,500
Campbell Estates	300	Evergreen Cemetery	35	Lakewood Estates Water C	750
Canada Hills Water Co	5,012	Exxon Corporation	200	Las Quintas Serenas WC	1,169
Canyon Ranch	485	Far Horizons East	1,500	Manor Trailer CC	170
Carol Anne Dr Homeowners	52	Far Horizons Mobile Home	290	Marana Water Service Inc	1,715
Casa Motel & Camping	30	Farmers Water	2,389	Mesaland Water Co-op	350
Casitas De Castilian	200	Federal Corr Institute	750	MDWID - Metropolitan Domestic Water	
Catalina Country Mobile	130	Flowing Wells Irrigation District	16,160	Improvement District	36,250
Caterpillar Water	65	Foothills Mobile Homes	95	Midvale Farms Water Company	200
Colonial Mobile & Trailer	150	Forty-Niners Water Company	790	Mirabell Water Coop	210
Community Water - Green Valley	12,320	Francesca Water Company	100	Mission Palms Apartments	900
Continental School	250	Fred's Arena Bar & Steak	40	Mr G's Diner	50
		Green Valley Water Company	8,125	Mt Lemmon Water Co	600

<u>Water System</u>	<u>Population Served</u>				
North La Cholla MHP	100	Saguaro National Park	420	Town & Country MHP	640
Oracle Villa Apartments	822	Saguaro Water Company	35	Town of Oro Valley Water	10,850
Orchard Valley MHP	80	Sahuarita Heights Mobile	110	Tra-tel Tucson RV Park	50
Organ Pipe NM-Headquarters	412	Sahuarita Sch, Dist 3,	1,800	Tucson Electric Power Co	550
Pacific Fruit Express	50	Sahuarita Village Water	135	Tucson General Hospital	500
Palm Vista Estates MHP	400	Sahurita Park Pcp	40	Tucson Meadows MHP	650
Pantano Water Coop	98	Salpointe High School1	288	Tucson Medical Center	2,500
Pima County Parks	9,142	Samalayucca Improvement	150	Tucson Racquet Club	400
Pima Cnty Dot Avra Valle	106	Sandario Water Co	555	Tucson Rock	40
Pima Ramada Mobile Home Park	35	Santa Catalina Mission Church	100	Tucson Rock and Sand	40
Pita Water	38	Sasabe Border Water Co	68	Tucson Water Dept	55,3040
Quail Creek Water	180	Shae Water Company	28	University of Arizona	1,5950
Quail Valley Tennis Club	40	Sierra Court Trailer Park	100	Universal Ranch Store	8
Rabies Control Center	20	Sierra Tucson	100	USAF-Davis Monthan AFB	8,900
Rainbow Tavern	51	Sierrita Foothills	50	United States Forest Service	950
Raindance Water Coop	60	Sierrita Mountain Water	80	Vail School	110
Rancho De La Osa	40	Siete Casas Joint Venture	60	Val Verde Inc	45
Rancho Del Conejo Water	522	Silver Cholla Park	200	Valle Verde Del Norte	300
Rancho Los Amigos MHP	200	Sleepy Hollow MHP	1,110	Veterans Medical Center	900
Rancho Sierrita Well Assc	102	Solana & Sombra MHP	200	Via Verde West MHP	100
Rancho Tierra Blanca	40	Soldier Camp Permittees	50	Villa Capri Trailer Park	420
Rancho Vistoso Water Co	4,300	Sopori Elementary School	300	Vision Quest Annex	30
Ranchwood Mobile Park	200	Southern Pines Baptist Church	100	Vista Del Norte TP	750
Ray Water Co Lansing Str	2,880	Spanish Trail Water Co	770	Voyager Water Company	2,500
Regina Cleri Center	25	St Joseph's Hospital	1,400	Webb's Steak House	60
Rillito Water Users Assoc	200	Su Casa MHP	100	Wells Fargo Well Assoc	80
Rincon Country East Rv re	920	Summit Water Company	33	White Stallion Guest Ran	45
Rincon Mesa Landowner's	65	Summit Water Coop	78	Wildflower Water Co-op	84
Rincon Ranch Estates Water Co	905	Tanque Verde Guest Ranch	40	Winter Haven Ranch	125
Rincon Water Co	50	Terminal Stations	500	Winterhaven Water & Dev	765
Rio Vista Mobile Home Pa	2000	The Lazy Bone RV Resort	300	Wycliffe Mountain Vista	26
Riverside Apts	10	Thim Utility Company	828	Zimmerman Enterprises	200
		Thunderhead Ranch	93		

Source: U.S. Environmental Protection Agency Web Site: www.epa.gov

EFFLUENT USE ALTERNATIVES

Following is a list of effluent projects and potential alternatives as of January 1999, compiled by the Regional Effluent Planning Partnership.

What happens to effluent today?

1. Santa Cruz River discharge. This represents the existing conditions and incidental recharge.
2. City of Tucson Reclaimed Water System. Direct use of tertiary effluent.
3. Agricultural irrigation. The reuse of treated secondary effluent for the irrigation of non-food agriculture.

ALTERNATIVES — IN PROGRESS

1. Santa Cruz River Managed Underground Storage Facility (Roger Road to Ina Road). Acquiring credits for existing discharge which is recharging the aquifer.
2. Santa Cruz River Managed Underground Storage Facility (Ina Road to Red Rock). Acquiring credits for existing discharge which is recharging the aquifer.
3. Rillito/Swan Effluent Wetland Recharge. This project involves additional treatment and constructed recharge.
4. Kino Effluent Wetland Recharge. This project combines the direct reuse of reclaimed water for turf irrigation with a constructed recharge operation.
5. Marana High Plains Effluent Recharge Project. Constructed recharge and vegetation enhancement.
6. Atturbury Wash Project. Wetlands treatment and dry well recharge at Lincoln Regional Park in the west tributary of Atturbury Wash.
7. Lower Santa Cruz Replenishment Project located north of Avra Valley Road. Direct recharge using basins and streambed.

FUTURE/PROPOSED ALTERNATIVES

1. Santa Cruz River Managed Underground Storage Facility, 100 percent credit accrual for SAWRSA effluent. Managed recharge Roger Road to Red Rock.
2. Wastewater reclamation in Oro Valley and Metro Water service areas. This project would include a wastewater reclamation facility and effluent lines to existing and planned golf courses or, possibly, to recharge basins.
3. Effluent Reuse in Green Valley. The project would involve the use of effluent for golf course turf irrigation and agricultural irrigation.
4. Avra Valley Wetlands Treatment and Effluent Recharge Project. Wetlands treatment and basin recharge.
5. Marana Santa Cruz River Park and Recharge Project. This project provides for a combination of facilities including constructed and managed recharge facilities and turf areas for irrigation reuse. Located at Cortaro Farms Road and the Santa Cruz River.
6. Tangerine Road Wastewater Pollution Control Facility.
7. Pascua Yaqui Golf Course and Pascua Yaqui Recharge Projects.
8. Harrison-Pantano water reclamation facility. Reclamation facility that will provide effluent suitable for reuse, recharge or discharge to Pantano Wash.
9. Kolb/Bilby water Reclamation Facility. Reclamation facility that will provide effluent suitable for reuse, recharge or discharge to a nearby watercourse. The proposed site is in the vicinity of Kolb and Bilby Road.
10. Santa Cruz River downtown enhancement.

RATE STRUCTURE FOR TUCSON WATER

Tucson Water's charges (as of summer 1999) for delivery of potable water are comprised of four basic components: Minimum Charge, Usage Charge, Isolated Area Service Charge, and CAP Charge. Each of the components and its specific rate schedules is discussed in the following section. Tucson Water bills its customers on a monthly basis; all charges shown are monthly charges.

Minimum Charge

The minimum charge for all metered accounts is based upon the meter size and is levied whether or not any water is used. The charge includes a 3 Ccf minimum usage allowance for all customer classes except for sub-metered mobile home parks which receive a minimum usage allowance based on the number of occupied units. The monthly minimum charges are as follows:

Service Charge	Meter Size (inches)	Service Charge (\$)
	0.75	\$ 5.30
	1.00	\$ 6.40
	1.50	\$ 9.50
	2.00	\$ 14.00
	2.50	\$ 20.00
	3.00	\$ 25.00
	4.00	\$ 42.00
	6.00	\$ 82.00
	8.00	\$ 123.00
	10.00	\$ 185.00
	12.00	\$ 305.00

Usage Charge

The usage charge for all metered accounts is based upon the actual water utilized by the customer between monthly meter readings in excess of the minimum water use allowance. Charges for non-residential customers are further divided between winter and summer rate schedules. Winter rates are applicable to water usage from November through April. Summer rates are applicable to water usage from May through October.

For customers in the Multifamily, Submetered Mobile Home Park, Commercial, and Industrial customer classes, a two-tiered summer surcharge is charged for water usage above the customer's average monthly water usage for the previous winter rate period (November - April). Tier 1 is charged on all water used during the month which exceeds the customer's monthly winter average usage. Tier 2 is an additional charge on all water used during the month which exceeds 150 percent of the customer's monthly winter average usage. All charges identified below are based upon water use in units of Ccf (100 cubic feet). One Ccf equals 748 gallons.

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Customer Class/Charge	Amount (Ccf)	Winter (\$/Ccf)	Summer (\$/Ccf)
Residential - single family	0 - 3	0.00	0.00
	4 - 15	1.62	1.62
	16 - 30	2.61	2.61
	over 30	3.29	3.29
Duplex-Triplex	0 - 3	0.00	0.00
	4 - 20	1.62	1.62
	21 - 35	2.61	2.61
	over 35	3.29	3.29
Multi-family	0 - 3	0.00	0.00
	over 3	1.35	1.35
	summer surcharge - tier 1		0.95
	summer surcharge - tier 2		0.25
	maximum charge per Ccf		2.55
Submetered mobile home parks	0 - 3	0.00	0.00
	over 3	1.35	1.35
	summer surcharge - tier 1		0.95
	summer surcharge - tier 2		0.25
Commercial	0 - 3	0.00	0.00
	over 3	1.40	1.40
	summer surcharge - tier 1		0.95
	summer surcharge - tier 2		0.25
Industrial	0 - 3	0.00	0.00
	over 3	1.21	1.21
	summer surcharge - tier 1		0.95
	summer surcharge - tier 2		0.25
Construction	0 - 3	0.00	0.00
	over 3	1.89	1.89
	maximum charge per Ccf		2.41

Isolated Area Service Charge

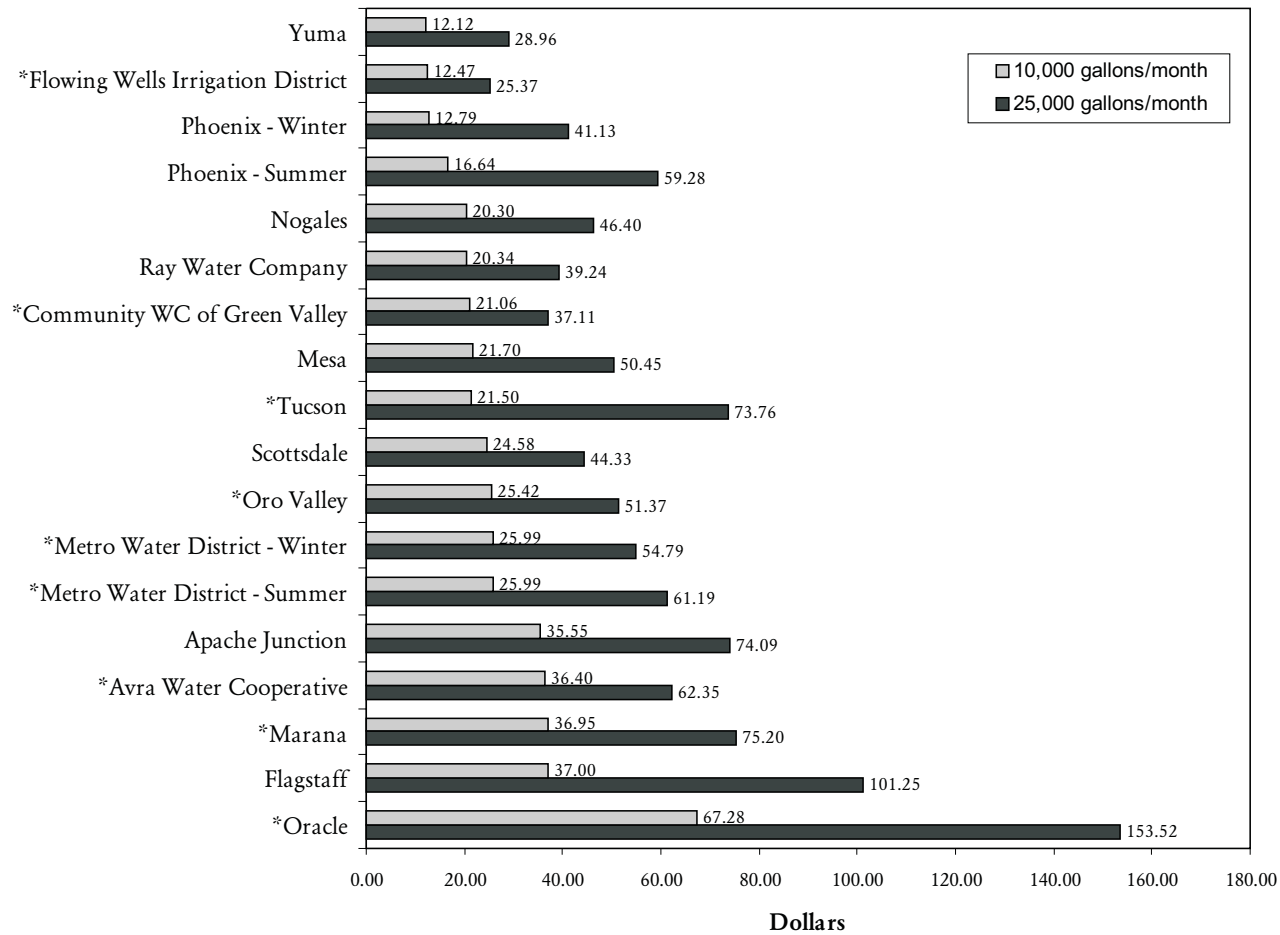
For water customers who are located in water delivery areas that are isolated and not connected to Tucson Water’s central service area, an isolated area service charge is applied to each Ccf of monthly water usage to cover the higher costs of providing water to these isolated areas. The rates are \$0.35/Ccf.

CAP Charge

All Tucson Water customers are charged a CAP fee applied to each Ccf of monthly water usage. This charge contributes to covering costs associated with the Central Arizona Project. The rates are \$0.02/Ccf.

Source: Tucson Water Web Site: <http://www.ci.tucson.az.us/water/tsnwtr/rates/rate99.htm>

WATER BILLS FOR SELECTED ARIZONA WATER PROVIDERS



Monthly base charge plus commodity charges. Excludes taxes, surcharges, sewerage charges, etc.
 * Denotes Tucson area water providers.

NATIONAL PRIMARY DRINKING WATER STANDARDS

National Primary Drinking Water Regulations (NPDWRs or primary standards) are legally enforceable standards that apply to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems.

	MCLG ¹ (MG/L) ⁴	MCL ² OR TT ³ (MG/L) ⁴	POTENTIAL HEALTH EFFECTS	SOURCES OF CONTAMINANTS
INORGANIC CHEMICALS				
Antimony	0.006	0.006	Increase in blood cholesterol; decrease in blood glucose	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	none ⁵	0.05	Skin damage; circulatory system problems; increased risk of cancer	Discharge from semiconductor manufacturing; petroleum refining; wood preservatives; animal feed additives; herbicides; erosion of natural deposits
Asbestos	7 million (fiber >10 micrometers) fibers per Liter	7 MFL	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits
Barium	2	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium	0.004	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium	0.005	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits
Copper	1.3Action Level=1.3; TT ⁶		Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage. Those with Wilson's Disease should consult their personal doctor if their water systems exceed the copper action level.	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Cyanide (as free cyanide)	0.2	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories

	MCLG ¹ (MG/L) ⁴	MCL ² OR TT ³ (MG/L) ⁴	POTENTIAL HEALTH EFFECTS	SOURCES OF CONTAMINANTS
Fluoride	4.0	4.0	Bone disease (pain and tenderness of the bones); Children may get mottled teeth.	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Lead	zero Action Level=0.015	TT ⁶	Infants and children: Delays in physical or mental development. Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits
Inorganic Mercury	0.002	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and cropland
Nitrate (measured as Nitrogen)	10	10	“Blue baby syndrome” in infants under six months - life threatening without immediate medical attention. Symptoms: Infant looks blue and has shortness of breath.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (measured as Nitrogen)	1	1	“Blue baby syndrome” in infants under six months - life threatening without immediate medical attention. Symptoms: Infant looks blue and has shortness of breath.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines;
Thallium	0.0005	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and pharmaceutical companies
ORGANIC CHEMICALS				
Acrylamide	zero	TT ⁷	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment
Alachlor	zero	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops
Atrazine	0.003	0.003	Cardiovascular system problems; reproductive difficulties	Runoff from herbicide used on row crops
Benzene	zero	0.005	Anemia; decrease in blood platelets; increased risk of from cancer	Discharge from factories; leaching gas storage tanks and landfills
Benzo(a)pyrene	zero	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines

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	MCLG ¹ (MG/L) ⁴	MCL ² OR TT ³ (MG/L) ⁴	POTENTIAL HEALTH EFFECTS	SOURCES OF CONTAMINANTS
Carbofuran	0.04	0.04	Problems with blood or nervous system;	Leaching of soil fumigant used on rice and alfalfa reproductive difficulties.
Carbon tetrachloride	zero	.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities
Chlordane	zero	0.002	Liver or nervous; increased risk of cancer	Residue of banned industrial other industrial termiticide
Chlorobenzene	0.1	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories
2,4-D	0.07	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops
Dalapon	0.2	0.2	Minor kidney changes	Runoff from herbicide used on rights of way
1,2-Dibromo-3-chloropropane	zero	0.0002	Reproductive difficulties;	Runoff/leaching from (DBCP) soil fumigant used increased risk of cancer on soybeans, cotton, pineapples, and orchards
o-Dichlorobenzene	0.60.6		Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories
p-Dichlorobenzene	0.075	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories
1,2-Dichloroethane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
1-1-Dichloroethylene	0.007	0.007	Liver problems	Discharge from industrial chemical factories
cis-1, 2-Dichloroethylene	0.07	0.07	Liver problems	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	0.1		Liver problems	Discharge from industrial chemical factories
Dichloromethane	zero	0.005	Liver problems; cancer	Discharge from increased risk of pharmaceutical and chemical factories
1-2-Dichloropropane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
Di(2-ethylhexyl)adipate from chemical factories	0.40.4		General toxic effects or reproductive	Leaching from PVC plumbing systems; discharge difficulties
Di(2-ethylhexyl)phthalate	zero	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories
Dinoseb	0.007	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables

	MCLG ¹ (MG/L) ⁴	MCL ² OR TT ³ (MG/L) ⁴	POTENTIAL HEALTH EFFECTS	SOURCES OF CONTAMINANTS
Dioxin (2,3,7,8-TCDD)	zero	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories
Diquat	0.02	0.02	Cataracts	Runoff from herbicide use
Endothall	0.1	0.1	Stomach and intestinal problems	Runoff from herbicide use
Endrin	0.002	0.002	Nervous system effects	Residue of banned insecticide
Epichlorohydrin	zero	TT ⁷	Stomach problems; reproductive difficulties; increased risk of cancer	Discharge from industrial chemical factories; added to water during treatment process
Ethylbenzene	0.7	0.7	Liver or kidney problems	Discharge from petroleum refineries
Ethylene dibromide	zero	0.00005	Stomach problems; reproductive difficulties; increased risk of cancer	Discharge from petroleum refineries
Glyphosate	0.7	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use
Heptachlor	zero	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide
Heptachlor epoxide	zero	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor
Hexachlorobenzene	zero	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene	0.05	0.05	Kidney or stomach problems	Discharge from chemical factories
Lindane	0.0002	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	0.04	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl (Vydate)	0.2	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes
Polychlorinated biphenyls (PCBs)	zero	S	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemical
Pentachlorophenol	zero	0.001	Liver or kidney problems; increased risk of cancer	Discharge from woodpreserving factories
Picloram	0.5	0.5	Liver problems	Herbicide runoff
Simazine	0.004	0.004	Problems with blood	Herbicide runoff

Water in the Tucson Area: Seeking Sustainability

	MCLG ¹ (MG/L) ⁴	MCL ² OR TT ³ (MG/L) ⁴	POTENTIAL HEALTH EFFECTS	SOURCES OF CONTAMINANTS
Styrene	0.1	0.1	Liver, kidney, and circulatory problems	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene	zero	0.005	Liver problems; increased risk of cancer	Leaching from PVC pipes; discharge from factories and dry cleaners
Toluene	1	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories
Total Trihalomethanes (TTHMs)	none ⁵	0.10	Liver, kidney or central nervous	Byproduct of drinking water disinfection system problems; increased risk of cancer
Toxaphene	zero	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle
2,4,5-TP (Silvex)	0.05	0.05	Liver problems	Residue of banned herbicide
1,2,4-Trichlorobenzene	0.07	0.07	Changes in adrenal glands	Discharge from textile finishing factories
1,1,1-Trichloroethane	0.2	0.20	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	0.003	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories
Trichloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from petroleum refineries
Vinyl chloride	zero	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories
Xylenes (total)	10	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories
Beta particles and photon	none ⁵ per year	4 millirems	Increased risk of cancer	Decay of natural and man-made deposits
Gross alpha particle activity	none ⁵	15 picocuries per Liter (pCi/L)		Increased risk of cancer Erosion of natural deposits
Radium 226 and Radium 228	none ⁵	5 pCi/L		Increased risk of cancer Erosion of natural deposits
MICROORGANISMS				
Giardia lamblia	zero	TT ⁸	Giardiasis, a gastroenteric disease	Human and animal fecal waste

	MCLG ¹ (MG/L) ⁴	MCL ² OR TT ³ (MG/L) ⁴	POTENTIAL HEALTH EFFECTS	SOURCES OF CONTAMINANTS
Heterotrophic plate count	N/A	TT ⁸	HPC has no health effects, but can indicate how effective treatment is at controlling microorganisms.	
Legionella	zero	TT ⁸	Legionnaire's Disease, commonly known as pneumonia	Found naturally in water; multiplies in heating systems
Total Coliforms (including zero fecal coliform and E. Coli)		5.0% ⁹		Used as an indicator that other potentially harmful bacteria may be present ¹⁰ Human and animal fecal waste
Turbidity	N/A	TT ⁸	Turbidity has no health effects but can interfere with disinfection and provide a medium for microbial growth. It may indicate the presence of microbes.	Soil runoff
Viruses (enteric)	zero	TT ⁸	Gastroenteric disease	Human and animal fecal waste

National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

Contaminant	Secondary Standard	Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L	Iron	0.3 mg/L
Chloride	250 mg/L	Manganese	0.05 mg/L
Color	15 (color units)	Odor	3 threshold odor number
Copper	1.0 mg/L	PH	6.5-8.5
Corrosivity	noncorrosive	Silver	0.10 mg/L
Fluoride	2.0 mg/L	Sulfate	250 mg/L
Foaming Agents	0.5 mg/L	Total Dissolved Solids	500 mg/L
		Zinc	5 mg/L

NOTES

1 Maximum Contaminant Level Goal (MCLG) - The maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health effect of persons would occur, and which allows for an adequate margin of safety. MCLGs are non-enforceable public health goals.

2 Maximum Contaminant Level (MCL) - The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. MCLs are enforceable standards. The margins of safety in MCLGs ensure that exceeding the MCL slightly does not pose significant risk to public health.

3 Treatment Technique - An enforceable procedure or level of technical performance which public water systems must follow to ensure control of a contaminant.

4 Units are in milligrams per Liter (mg/L) unless otherwise noted.

5 MCLGs were not established before the 1986 Amendments to the Safe Drinking Water Act. Therefore, there is no MCLG for this contaminant.

6 Lead and copper are regulated in a Treatment Technique which requires systems to take tap water samples at sites with lead pipes or copper pipes that have lead solder and/or are served by lead service lines. The action level, which triggers water systems into taking treatment steps if exceeded in more than 10% of tap water samples, for copper is 1.3 mg/L, and for lead is 0.015mg/L.

7 Each water system must certify, in writing, to the state (using third-party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05% dosed at 1 mg/L (or equivalent)* Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent).

8 The Surface Water Treatment Rule requires systems using surface water or groundwater under the direct influence of surface water to (1) disinfect their water, and (2) filter their water to meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels: * Giardia lamblia: 99.9% killed/inactivated Viruses: 99.99% killed/inactivated; * Legionella: No limit, but EPA believes that if Giardia and viruses are inactivated, Legionella will also be controlled; * Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelometric turbidity units (NTU); systems that filter must ensure that the turbidity goes no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples for any two consecutive months; * HPC: NO more than 500 bacterial colonies per milliliter.

9 No more than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive). Every sample that has total coliforms must be analyzed for fecal coliforms. There cannot be any fecal coliforms.

10 Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms.

Source: Environmental Protection Agency Web Site: www.epa.gov

1999 WATER RATE SCHEDULE FOR THE CENTRAL ARIZONA PROJECT

Cost Component	1999	2000	2001	2002	2003
Municipal/Industrial Charges (1)	\$48/af	\$54/af	\$54/af	\$54/af	\$54/af
Agricultural Charges (2)	2/af	2/af	2/af	2/af	2/af
Water Delivery Costs:					
Fixed OM&R (3)	31/af	Determined Annually			
Pumping Energy (4)	38/af	Determined Annually			
Total 1999 Delivery Costs	\$69/af				
Delivery Rates	1999	2000	2001	2002	2003
Municipal and Industrial (A)	\$69/af	\$70/af	\$72/af	\$73/af	\$75/af
Agricultural					
Pool 1 (200,000 af) (B)	32/af	33/af	34/af	35/af	36/af
Pool 2 (200,000 af) (C)	22/af	23/af	24/af	25/af	26/af
Pool 3 (5,D)	45/af	Determined Annually			
M&I Incentive Recharge (6,E)	43/af				
Federal (F)	69/af	70/af	72/af	73/af	75/af
AWBA (G)	43/af				
Miscellaneous Uses (7, H)	43/af	Determined Annually			

Notes:

1. Paid on full allocation regardless of water deliveries, not included in delivery rates.
2. Paid on actual deliveries and included in delivery rates.
3. \$43.5 million fixed OM&R costs ÷ 1,416,000 af of projected deliveries = \$31/af. This amount is collected on all ordered water whether delivered or not.
4. \$53.6 million pumping energy costs ÷ 1,416,000 af of projected deliveries = \$38/af. This amount is collected only for water actually delivered.
5. Rate is pumping energy component plus \$5 contribution to fixed OM&R plus the \$2 agriculture capital charge.
6. Rate is pumping energy component plus \$5 contribution towards fixed OM&R. See reverse side for rules regarding eligibility for and use of M&I incentive recharge water.
7. Rate is pumping energy component plus \$5 contribution towards fixed OM&R.
- A. M&I - The delivery rate for M&I subcontractors. For M&I users who are not subcontractors, we add the capital charge and create an Excess M&I contractor rate for "as available" water.
- B. Pool 1 - All agricultural entities who originally signed a subcontract.
- C. Pool 2 - Those agricultural entities that waived their subcontract rights in two-party agreements with CAWCD; CAWCD waived the agricultural take-or-pay requirements. Excluded those agricultural entities that relinquished their subcontracts to others for the benefit of their district, i.e., Harquahala Valley Irrigation District, Roosevelt Water Conservation District, and HoHoKam Irrigation District.
- D. Pool 3 - An agricultural customer who meets basic qualifications including those who want more than their allocated share of Pool 1 and Pool 2 water.
- E. M&I Incentive Recharge - A special program offered to M&I subcontractors only. They must have valid Arizona Department of Water Resources permits and must gain recharge/storage credits from this activity. The Board has approved this program through 1999. CAP may participate with some agricultural entities in a limited fashion.
- F. Federal - For federal purposes (Indians, USBR construction water, etc.).
- G. AWBA - Water purchases by the Arizona Water Banking Authority. It is available for scheduling after all other schedules have been filled.
- H. Miscellaneous Uses- Water for recreational and fish and wildlife purposes.

CAP WATER SUBCONTRACT AMOUNTS IN THE TUCSON AMA

Entity	Allocation (acre-feet)
City of Tucson	138,920
San Xavier District of Tohono O’odham Nation	27,000
State Land Department	14,000
Schuk Toak District of Tohono O’odham Nation	10,800
Metropolitan Domestic Water Improvement District	8,858
Flowing Wells Irrigation District	4,354
Spanish Trail Water Company	3,037
Town of Oro Valley	2,294
Green Valley Water Company	1,900
Midvale Farms	1,500
Community Water Company of Green Valley	1,337
Vail Water Company	786
Pascua Yaqui Tribe	500
Town of Marana	47

THE WATER CONSUMER PROTECTION ACT

THE PURPOSE OF THIS ARTICLE IS TO RESTORE FIRST CLASS DRINKING WATER TO THE PEOPLE OF TUCSON AND REPLENISH TUCSON'S GROUNDWATER SUPPLY BY AMENDING CHAPTER 27 OF THE TUCSON CODE AND ADDING A NEW ARTICLE VI PROVIDING FOR THE USE OF WATER RESOURCES.

Section 1. Chapter 27 of title Tucson code is amended by adding Article VI to read:

ARTICLE VI

WATER CONSUMER PROTECTION ACT

SECTION 27-90. METHOD

1. THE CITY OF TUCSON SHALL USE ONLY GROUNDWATER FROM UNPOLLUTED SOURCES AS ITS POTABLE WATER SUPPLY FOR A FIVE YEAR INTERIM PERIOD BEGINNING ON THE EFFECTIVE DATE OF THIS ARTICLE, EXCEPT AS SPECIFICALLY PROVIDED IN SECTION 27-91.

2. THE CITY OF TUCSON SHALL TAKE THE NECESSARY ACTIONS TO ENSURE THAT IT IS IN TOTAL COMPLIANCE WITH ITS EXISTING CONTRACT FOR CENTRAL ARIZONA PROTECT (CAP) WATER.

3. FOR FIVE YEARS FROM THE EFFECTIVE DATE OF THIS ARTICLE, CAP WATER DELIVERED TO THE CITY OF TUCSON SHALL BE USED ONLY FOR ONE OR MORE OF THE FOLLOWING PURPOSES;

(a) FOR SELLING OR EXCHANGING WATER UNDER THE TERMS OF THE CITY'S EXISTING CAP SUBCONTRACT.

(b) TO PRESERVE TUCSON'S GROUNDWATER FOR DOMESTIC USE BY REPLACING GROUNDWATER WHICH WOULD OTHERWISE HAVE BEEN WITHDRAWN FOR USES OTHER THAN AS POTABLE WATER SUCH AS AGRICULTURE, MING AND OTHER INDUSTRY.

(c) TO PREVENT LAND SUBSIDENCE AND AUGMENT TUCSON'S GROUNDWATER SUPPLY BY BASIN AND STREAM BED RECHARGE.

(d) TO REPLACE OTHER WATER SUPPLIES CURRENTLY BEING EMPLOYED FOR INDUSTRIAL AND LANDSCAPE IRRIGATION USE INCLUDING PARKS, GOLF COURSES AND SCHOOLS.

(e) FOR DIRECT WELL INJECTION IF IT IS TREATED AS DESCRIBED IN SECTION 27-91 AND IS FREE FROM DISINFECTION BYPRODUCTS.

SECTION 27-91. EXCEPTION

NOTWITHSTANDING ANY OTHER PROVISION OF THIS ARTICLE, CAP WATER MAY BE DIRECTLY DELIVERED AS A POTABLE WATER SUPPLY ONLY IF IT IS TREATED IN A MANNER SUFFICIENT TO ENSURE THAT THE QUALITY OF THE DELIVERED WATER IS EQUAL TO OR BETTER IN SALINITY, HARDNESS AND DISSOLVED ORGANIC MATERIAL THAN THE QUALITY OF THE GROUNDWATER BEING DELIVERED FROM TUCSON'S AVRA VALLEY WELL FIELD ON THE EFFECTIVE DATE OF THIS ARTICLE.

SECTION 27-92. RECHARGE.

1. THE CITY OF TUCSON SHALL NOT RECHARGE WATER IN ANY AREA THAT CONTAINS OR IS ADVERSELY EFFECTED BY TOXIC LANDFILLS.

2. TO PREVENT LAND SUBSIDENCE WITHIN THE CITY OF TUCSON'S CENTRAL WELL FIELD, ALL GROUNDWATER WITHDRAWALS SHALL BE COMPLETELY REPLENISHED, AS MEASURED OVER ANY FIVE YEAR PERIOD, USING RECHARGE INCLUDING RECHARGE OF CAP WATER AS PROVIDED IN SECTION 27-90. 3.(e).

SECTION 27-93.

DEFINITIONS

IN THIS ARTICLE, UNLESS THE CONTEXT OTHERWISE REQUIRES:

1. "POLLUTION" MEANS THE PRESENCE OF AN AMOUNT OF ANY SUBSTANCE IN GROUNDWATER WHICH EXCEEDS ANY STANDARD PRESCRIBED BY THE LAWS OF THE STATE OF ARIZONA OR THE UNITED STATES FOR POTABLE WATER.

2. "DISINFECTION BYPRODUCTS" ARE THE CHEMICAL COMPOUNDS FORMED WHEN CHLORINE, OZONE OR CHLORAMINES ARE USED TO DISINFECT WATER CONTAINING DISSOLVED ORGANIC MATERIAL.

Section 2.

FIVE YEARS AFTER THE EFFECTIVE DATE OF THIS ORDINANCE, THE MAYOR AND COUNCIL OF THE CITY OF TUCSON MAY, UPON A MAJORITY VOTE, SUBMIT TO THE REGISTERED VOTERS OF THE CITY FOR APPROVAL AT A CITY OF TUCSON GENERAL ELECTION A PROPOSAL TO REPEAL OR MODIFY ARTICLE VI OF CHAPTER 27 OF THE TUCSON CODE AS ADDED BY THIS ORDINANCE.

Section 3 SEVERABILITY

IF A PROVISION OF THIS ORDINANCE OR ITS APPLICATION TO ANY PERSON OR CIRCUMSTANCE IS HELD INVALID, THE INVALIDITY DOES NOT AFFECT OTHER PROVISIONS OR APPLICATIONS OF THE ORDINANCE THAT CAN BE GIVEN EFFECT WITHOUT THE INVALID PROVISION OR APPLICATION, AND TO THIS END THE PROVISIONS OF THIS ORDINANCE ARE SEVERABLE